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ABSTRACT

Two studies were conducted to test the situational theory of communication while at the same time using the theory to determine the nature of different environmental publics, the cognitive strategies they use to resolve environmental issues, and their demographic characteristics. One study identified and examined urban environmental publics, while the other worked with rural publics. Eight environmental issues were used for the situation perception and communication behavior variables in each study with questions eliciting the problem recognition, level of involvement and constraint recognition of the subjects for each issue. Information seeking, information processing, and knowledge of actual environmental news were also measured. Results showed that in both rural and urban samples there was a public concerned with general environmental issues, but that different publics emerged from special interest problems such as superhighways and whale extinction. When an issue affects nearly everyone, as do energy and air pollution, people who otherwise would not be concerned with the environment become members of a special environmental public. Finally, publics characterized by behavior similarities cannot be identified by demographic indicators and personal activities or attitudes. (JL)

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JAMES E. GRUNIG

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JAMES E. GRUNIG

Communication Behaviors and Attitudes Of Environmental Publics: Two Studies

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THE PURPOSE OF SCIENCE is to construct theories that will solve problems of concern to researchers in a domain of science (Meehan, 1968; Laudan, 1977). Theories, however, can serve as psychological blinders, narrowing the perceptions of researchers to those aspects of reality that they expect will confirm or disconfirm their theories (Kuhn, 1970). In the field of environmental communication, the principal phenomenon of concern to researchers has been the behavior of people in situations where there is a need to conserve and protect the environment. The principal theory used to explain that behavior has been the classical cross-situational theory of attitudes. Attitude theory holds that behavior in specific situations is a function of attitudes that a person carries from situation to situation and that predispose him to behave in each situation in a way consistent with his attitudes.

In this traditional approach, the function of communications is to change these cross-situational attitudes in order to "reprogram" behavior in specific situations. Most of the research related to environmental communication has been restricted by this cross-situational attitude paradigm, as most researchers have attempted either to support or refute the theory. Ramsey and Rickson (1976), for example, reported that in several issues of the *Journal of Environmental Education,* more than half the authors stated directly that desirable knowledge or attitudes are conditions for intelligent environmental policy making.

Reviews of the literature on environmental communication (e.g., Grunig, 1977a) show a preoccupation with research either supporting or refuting the cross-situational paradigm. Studies have both supported the paradigm (e.g., Burrus-Bammel, 1978, and Weigel and Weigel, 1978) and

refuted it (e.g., Stamm, 1972, Stamm, 1973, and Tichenor, et al., 1971). These conflicting results do not mean the attitudinal theory is true or false, only that it does not consistently explain the relationship between communication, attitude, and behavior. Research in environmental communication would be more fruitful, therefore, if it were directed toward the construction of a new theory rather than toward support or refutation of a theory that has been repeatedly shown to have only partial explanatory power.

This monograph will review research on environmental communications, present a new, situational theory of communication behavior and attitudes that is consistent with the literature, and then present the results of two studies using the theory.

Previous Research on Environmental Attitudes

Most of the studies on environmental attitudes have simply measured how many members of the public have desirable environmental attitudes. For example, a number of polls (Erskine, 1972a; Erskine, 1972b; Tichenor, et al., 1971; de Boer, 1977; and Lipsey, 1977) have indicated that most people agree pollution is an important national problem or that the environment receives too little financial attention from government. Polls also show that more people have become concerned with the environment over the years in which such polls have been conducted. There is much evidence, however, that this "concern" is superficial.

When polls use open-ended questions to ask people to list important national problems, fewer people mention the environment than when they are asked to agree or disagree with closed-ended questions about the environment. In an Illinois sample (Simon, 1971), 95 and 91 percent of the respondents agreed with statements that air and water pollution were important problems for the United States. Only 13 percent of the sample mentioned pollution, however, when they were given no specific cues to pollution in an open-ended question asking respondents to name the most important national problems. In a Durham, North Carolina, sample (Murch 1971), 74 percent of the respondents said pollution was a serious national problem, but only 13 percent said it was a serious problem in Durham—even though pollution levels were as high there as in the rest of the country. In general, people seem concerned with the environment on an abstract level, but do not seem to associate it with their own lives enough to become knowledgeable about the environment or to take action to solve environmental problems (Lipsey, 1977). Murch (1971) found, for example, that half of his sample did not know of a solution to the pollution problem and half could not suggest anything they could do personally to help solve the problem. Moore (1973) found public knowledge of ecology to be at a low level. Likewise, Simon (1971) found that practically no one

made any connection between population and pollution in an Illinois sample.

Other researchers (Bailey, 1971; Allen 1972; Tognacci, et al., 1972; Constantini and Hanf, 1972; Dunlap, 1975; Swann, 1970; Hershey and Hill, 1977-78; Honnold and Nelson, 1978; Bultena, et al., 1977; Buttel & Flinn, 1978; and Buttel, 1975) have shown that concern for the environment is limited to specific segments of the public. In general, environmental concern is most prevalent among the young, whites, the college-educated, the upper occupational classes, those with liberal political orientations, those who are more cosmopolitan, and those who appreciate aesthetic and rural values. Koenig (1975) found concern for the environment to be one part of an overall concern about socio-economic issues.

It would appear that these results can be explained by the familiar knowledge-gap hypothesis, which states that those who already have the most information take in more new information than those with less initial information (Bailey, 1971). Tichenor, et al. (1973), however, found a knowledge gap in several Minnesota communities only for national issues that did not affect the communities. For issues that directly involved the community, people of less education and lower status had as much knowledge as those with demographic characteristics usually associated with information seeking. Others have shown that when a person's self interest is at stake, his concern for the environment abates. For example, Sharma, Kivlin and Fliegel (1975) found that residents of an Illinois city who were most committed to solving a water pollution problem caused by a local meat packing plant had little to lose if the plant were closed. Likewise, respondents in four Minnesota communities were less likely to support restrictive environmental measures that would affect employment in their community than they were to support such measures in other communities, especially respondents from small, less pluralistic communities (Tichenor, et al., 1971; Donohue, et al., 1974).

Although most of these studies have simply described public attitudes toward the environment, their value to the environmental communicator depends upon the explanatory power of the theory behind the studies. The theory that is implicit in these studies postulates that communication can change attitudes and that modified attitudes will lead to changes in behavior. Stamm (1973: 228) compared this approach to that of the early alchemists in the physical sciences:

> ...Environmental communicators often arrive at a purpose closely parallel to that of early alchemists who sought to transform less desirable metals into gold. The environmental communicator, too, begins with a material of lesser desirability—the unlovely human mind, in many instances wholly lacking in environmental awareness and ecological values. The communicator hopes to add something to the cognitive material that will elevate it to a state of

"ecological conscience." ...The problem is to discover the manipulations, the treatments that bring this transformation about.

Some environmental researchers have reported results supporting this traditional theoretical paradigm (e.g., Burrus-Bammel, 1978). Most researchers who have tested, rather than assumed, the validity of the theory, however, have concluded that the theory has serious deficiencies. Stamm (1973: 228), for example, concluded that the history of what he called alchemy research in the field of mass communication has "taught us two things: (1) that salient attitudes are not subject to manipulation through short-term communication programs and (2) that attitudes are unreliable predictors of behavior." In two reviews of research on environmental communication, Stamm (1972, 1973) concluded that there is evidence that environmental information campaigns can increase public knowledge and awareness about the environment but that there is little support for the assumptions that increased knowledge changes attitudes or that attitudes predict behavior.

Tichenor, et al. (1971), found, for example, that when an environmental problem involved a community, the people most opposed to restrictive environmental measures were also the most knowledgeable. Burrus-Bammel (1978) found that although a forest camp changed both knowledge and attitudes, knowledge and attitudes were not related. In a study of an Iowa reservoir project, Bultena, et al. (1977), found that residents with the most knowledge about the project had the strongest attitudes, *both for and against the project*. Those with little knowledge had no attitude. Bultena, et al., also concluded that variables related to the reservoir issue could explain more variance in respondent evaluations of the project than could general attitudes or personal attributes of the respondents.

Researchers of environmental communications, in other words, have not been able to demonstrate that people's attitudes and behavior are consistent across situations. The results of research on environmental communication and attitudes seem to require a situational explanation. People are more likely to communicate about some environmental situations than about others, and people are likely to evaluate solutions to environmental issues differently in different situations.

The Attitude-Behavior Controversy: General Literature

Environmental communication researchers have not been alone in their preoccupation with the concept of attitude. Attitude has been, with little doubt, the most prevalent concept in the literature of social psychology. The concept has diffused from there to marketing, political science, communication, management, and education. In social psychology, as in most of these related fields, the debate over the lack of consistency between at-

titude and behavior has emerged as one of the most important contemporary controversies in social science (Liska, 1975).

La Piere (1934) conducted the seminal study that is nearly always cited as first showing the inconsistency of attitudes and behavior. La Piere sent Chinese couples to 251 restaurants on the West Coast. Only once was a couple refused service. Six months later, he sent questionnaires to the restaurant managers asking if they would serve Chinese people, and all but one said they would not. Later, Festinger (1964) described the relationship between attitudes and behavior as the most important and long-range problem in attitude theory. But he reported that when he examined the literature for studies of the problem he could find only three, "one of which is of dubious relevance and one of which required reanalysis of data." After analyzing these three studies, he concluded that there was little evidence to support a theoretical relationship between attitudes and behavior.

Seibold (1975:7) reported finding 16 additional empirical studies published since Festinger's article. He reported that "careful study of these reports reveals an even split between those reporting moderate to high verbal report-overt behavior correspondence compared with those finding low consistency between these data points." Seibold added that only one article reported a high level of correspondence between verbalized attitudes and overt behavior.

Anomalous findings such as those reported in Festinger (1964) and Seibold (1975) have stimulated a number of researchers to explore theoretical and methodological changes that might reveal higher attitude-behavior correspondence. Most of that research seems to be leading more to a situational theory than to conventional cross-situational theories of attitude (Schuman and Johnson, 1976; Eagly and Himmelfarb, 1978). The cross-situational theory of attitudes presupposed what DeFleur and Westie (1963) defined as the latent process view of attitude. The latent process view assumes that attitudes represent underlying general predispositions to respond that have a causal relationship to verbalized opinions or overt behaviors in specific situations. When a single, latent attitude applies to different situations, behaviors should be consistent across situations.

Already in 1963, DeFleur and Westie (1963: 35-37) recognized the effect of situational variables upon the attitude-behavior relationship. They stated that "there are clearly situational factors such as group norms, roles, definitions of situations, and other social constraints which materially 'mediate' responses in situations involving either verbal behavior or overt action." They added that "A latent something interposed between attitudinal behavior patterns and the social variables which mediate them is simply unnecessary."

Many attitude researchers such as Fishbein and Ajzen (1975), Ajzen and Fishbein (1970), Fishbein (1967), Triandis (1977), Anderson and Lipsey (1978), and Crespi (1977) seemed to have solved the attitude-behavior anomaly by defining attitudes as more situation specific than the generalized "latent process" concept of attitude and thus more closely related to overt behaviors. Generally, specific measures of attitude have correlated more closely with behaviors than have general measures of attitude (Schuman and Johnson, 1976). A number of earlier theorists also developed concepts that incorporated some aspect of the situation into attitude-behavior theory. These efforts have included Hovland's (1959) attempt to reconcile conflicting results of experimental and field studies of attitude change, Rokeach's (1968-69) distinction between attitudes toward objects and attitudes towards situations, and Carter's (1965) distinction between situational "pertinences" and cross-situational "saliences." The conventional definition of "opinions" as situational manifestations of attitudes also suggested that attitudes may not always be applied in specific situations.

Many attitude researchers also have developed multivariate theories of behavior by incorporating non-attitudinal variables—most of them situational—into their explanations of behavior. The non-attitudinal variables used to explain behavior have included such variables as an individual's assessment of the consequences of a behavior, normative pressures, and situational constraints (Seibold, 1975). Gross and Niman (1975) found four personal factors and six situational factors in the literature that researchers have found to contribute to inconsistency of attitudes and behaviors. The personal factors included other attitudes, competing motives, verbal, intellectual and social abilities, and activity levels. Situational factors included the actual or believed presence of certain people, normative prescriptions of proper behavior, availability of alternative behaviors, specificity of attitude objects, unforeseen extraneous events, and expected and/or actual consequences of acts. Thus, they concluded:

> In summary, situational variables have generally yielded the highest correlation between attitude and behavior. Knowledge of situational variables results in better predictions of an individual's behavior than does knowledge of individual differences. Intrapersonal (or individual-difference) variables become more important as predictors when their interactions with situational factors are considered (p. 365).

Theories of attitude and behavior therefore have become more situational and complex in recent years. The most often cited theories of attitude and behavior are those of Fishbein and Ajzen (1975) and Triandis (1977). Also relevant are Seibold and Rober (1979) and Schuman and Johnson (1976). Still many researchers question whether there is yet an

adequate attitude theory. As Liska (1974:20) concluded in his review of attempts to resolve the consistency controversy:

> Looking backward over the last four decades, social scientists have shifted from assuming the attitude-behavior relationship to measuring the attitude-behavior relationship to recently researching the conditions which affect the attitude-behavior relationship. If the insipient contemporary trend continues to develop, attitude-behavior research in the 1970's should be multivariate and complex in nature...Perhaps, however, the most pressing problem of the 1970's is the need to formulate a unitary conceptual and methodological framework in terms of which the work in various research traditions can be integrated.

From the viewpoint of communication research, what is further needed is a unitary theory of communication behavior and communication effects, a theory that explains when and how communication occurs and when it is likely to affect cognition, attitude, and behavior. The situational theory developed in this monograph and elsewhere is presented here as a possible candidate for such a unitary theory. Before it can be developed in full, however, it is necessary to examine cross-situational versus situational theories of communication that have paralleled cross-situational versus situational theories of attitudes and behavior.

The Attitude-Behavior Controversy: Communication Literature

Early communication theories were directly related to early attitude theories. They postulated that communications form or change attitudes. Festinger (1964: 404), for example, began his discussion of the attitude-behavior relationship by stating:

> ...We now know a good deal about the effects on opinion change of varying the structure of a persuasive communication—whether it is one-sided or two-sided, whether it is fear arousing or not, whether pro arguments precede or follow con arguments, and whether it is attributed to trustworthy or untrustworthy sources. Phenomena such as sleeper effects, immunization to counterpropaganda, assimilation and contrast effects are beginning to be understood.

When research results generally failed to yield consistent effects of communications upon attitude (Klapper, 1960), communication theorists developed balance and dissonance theories (see, for example, Festinger, 1957) to explain why people exposed themselves to information consistent with their attitudes rather than to information that would change their attitudes. But dissonance theory, too, had its anomalies. Research showed that the selective information seeking hypothesis applied only to postdecisional situations and not to predecisional situations (Festinger, 1964). It also could not explain when dissonance would result in selective communication and when it would result in attitude change (Aronson, 1968).

Balance and dissonance theories reversed the temporal relationship between communications and attitude. Instead of attitudes being a func-

tion (at least in part) of communications, communication behavior became a function of attitude. Because theorists still perceived attitudes to be cross-situational, balance theories of communication behavior remained cross-situational theories. Until recently, most communication theories, like most attitude theories, also have been cross-situational.

As Hewes and Haight (1979) noted, communication researchers have explained communication behaviors with such trait variables as Machiavellianism, self-concept, introversion, anomie, dogmatism, anxiety, reticence to communicate, predisposition toward verbal behavior, communication apprehension, self-esteem, and extroversion. Hewes and Haight tested the consistency of six interpersonal communication behaviors supposedly connected to reticence and predisposition toward verbal behavior and found little evidence for cross-situational consistency of these behaviors that are supposedly caused by the same personality traits. They called for a situational theory of communication:

> ...Person-situation interactions appear to be a viable approach for communication researchers. Hopefully, communication researchers will be able to avoid the problems of living in a cross-situationally inconsistent world...If we fail to circumvent the cross-situational problem a major reassessment of communication research priorities and paradigms must be forthcoming (p. 265).

A trend line of both attitude and communication research thus seems to point toward a situational theory of communication, attitude, and behavior. The great deal of attention now being paid to teleological (intentional), phenomenological, and rules approaches to communication theory (Cushman and Pearce, 1977) also suggests that an adequate theory of communication behavior and effects should contain a teleological as well as causal component. Hewes and Haight (1979) pointed out, for example, that several attitudinal scholars have stated that behavioral researchers have a tendency to explain their own behavior as being appropriate for different situations and to explain the behavior of their research subjects as resulting from the effect of some underlying predisposition. When we think of what we do and why we do it, we reconstruct the thinking that we did and how we translated that thinking into behavior. We assume that we controlled our behavior and that it was intentional, or teleological. (See Von Wright, 1971, for this definition of teleological). Yet as scientists we generally turn to a causal rather than a teleological theory to explain the behavior of others.

Many communication theorists have advocated a "phenomenological" approach (Hawes, 1977) that presents an extreme teleological theory. Phenomenologists argue that theorists must construct their theories in terms equally meaningful to the subject of the research as to the researcher. The phenomenologist believes that the theory must realistically

describe the intent and thinking of the human being whose behavior the theory attempts to explain.

A Situational Theory

A situational theory of communication, attitude, and behavior should make clear that the individual sometimes controls his own behavior and that sometimes the constraints of his environment control his behavior. In some situations the Skinnerian behaviorists (Skinner, 1974) have a "true" explanation of behavior; in other situations the phenomenologists have a "true" explanation. As Wilden (1979: 20-21) has put it:

> If we are led to feel that we must choose to say that in society we are either free or not free, then it makes no difference which pole of the paradox we choose. Alone, each alternative is contradicted by experience...The real question is not whether we are free or not free, but what we are free to do...The relevant terms are not in fact "free will" and "determinism," but "goalseeking"and "constraint" between which there is no contradiction...For an ecosystem is simply a "phase space" of hierarchically ordered constraints within which individual goalseeking systems are free to live and move and have their being. Individual goalseekers may follow any number of trajectories within this ordered space as long as no trajectory breaks the boundaries defined by a given level or set of constraints.

Seibold (1975: 11) also recognized the importance of "locus of control" in reconceptualizing the relationship between attitude and behavior. Both a person's verbal report of an attitude and his overt behavior, Seibold argued, differ according to whether he controls his own behavior or whether it is controlled by social norms or environmental contingencies.

The theory of communication, attitudes, and behavior developed here contains both teleological (self control) and causal (environmental control) relationships. As a situational theory it assumes that both external constraint and internal intent affect behavior, but that the relative effect of each will depend upon the situation. People exercise free will in situations that permit it or in which they think rational judgment is necessary. In other situations they must conform to authority, social rules, or physical limitations. In still other situations, people move serendipitously, because the movement simply does not mean that much to them (as for example, in the lack of serious attention to environmental problems described above).

The situational theory of communication behaviors and attitudes that is presented here states that how a person perceives a situation explains whether he will communicate about that situation, how he will communicate, and whether he will have an attitude relevant to the situation. The theory has been used to explain when people will communicate (Grunig, 1975, Grunig, 1976, and Grunig and Disbrow, 1977) and to explain when people will have cognitions (Grunig and Stamm, 1979, and Stamm and Grunig, 1977).

The theory consists of four independent variables that explain when and how communication will occur and two dependent variables that describe kinds of communication behavior.

Three of the independent variables explain when a person will communicate: problem recognition, constraint recognition, and presence of a referent criterion. *Problem recognition* represents the extent to which a person recognizes that something is missing or indeterminate in a situation so that he stops to think about the situation. The concept derives from John Dewey's (1938) idea that people do not think or inquire (communicate) about a situation unless it is problematic to them. Thus, problem recognition increases the probability that a person will communicate about a situation and have a need for information about that situation.

Constraint recognition represents the extent to which a person perceives constraints in a situation that limit his freedom to plan and carry out his own behavior. It indicates, therefore, when the locus of control becomes external. If a person realizes that his freedom to do something about a situation is limited, then information that helps him plan and make decisions about what to do in that situation will have little value. For example, a person who believes nothing can be done to save the whale would have little need for information from a "save the whale" committee.

Psychologists have for some time recognized the effects of external constraints on the behavior of individuals. Brehm and Cohen (1962), for example, found individual volition to be a necessary condition for the effects of cognitive dissonance to occur. Maslow (1963: 117) distinguished two kinds of "reality"—the natural world and the psychic world, the "world of unyielding facts and the world of wishes, hopes, fears, and emotions." Political scientists also have a concept related to constraint recognition, political efficacy—the extent to which an individual thinks he can affect the decisions of political leaders (Almond and Verba, 1963). Economists also recognize the importance of constraints on decision making and behavior. Linear programming, for example, is a mathematical procedure that economists use to maximize profits within the constraints of such available resources as land, labor and capital (Allen, 1962).

Combinations of high and low problem recognition and high and low constraint recognition have been used to define four types of perceived situations. These perceived situations have been used to identify publics that exhibit similar communication behaviors. These four behaviors that characterize publics can be called: problem-facing behavior (high problem recognition/low constraint recognition), constrained behavior (high problem recognition/high constraint recognition), routine behavior (low problem recognition/low constraint recognition), and fatalistic behavior (low problem recognition/high constraint recognition).

For each of these perceived situations, a person may bring a *referent criterion* from another situation, the third variable in the theory. A referent criterion is a cognition that a person brings from a previous situation that can be used as a decision rule in a new situation. In the usual distinction between the cognitive, affective, and behavioral components of attitude, the referent criterion represents the cognitive component. Thus, the referent criterion consists of accumulated information from previous situations, making it a concept quite similar to Woelfel and his colleagues' definition of attitude as accumulated information (Saltiel and Woelfel, 1975; Woelfel, Cody, Gillham and Homes, 1980). Although the individual can use a referent criterion in different situations, it does not represent a "latent process" type of attitude. Instead, it is a teleological, or intentional, concept. In a new situation the person may apply the referent criterion as an initial guide for resolving the situation. If the old criterion seems to work the person will use it. If it does not seem to work, he will develop a new criterion—a new solution—to guide his behavior in the new situation.

The referent criterion influences a person's communication behavior because it subsumes what he has learned in previous, related situations and thus reduces his need for new information to deal with a new situation. Only in routine behavior situations does a referent criterion stimulate communication. In routine behavior, the person does not stop to think about alternatives and selectively seek information to support his referent criterion, as Festinger's (1957) theory of cognitive dissonance holds.

The fourth variable in the theory, *level of involvement*, also explains when a person will communicate; but, more importantly, it also explains *how* he will communicate. Level of involvement is defined as the extent to which a person perceives a connection between himself and a situation. The stronger the connection with a situation, the more probable it is that the person will communicate about it.

Level of involvement also predicts when a person's communication behavior will be active or passive. Passive communication behavior is defined as *information processing* and active communication behavior is defined as *information seeking*. These two variables are the two dependent communication variables of the theory. A person purposively seeks information that has utility for him in deciding what to do in a situation. Thus information seeking occurs when the perceived level of involvement in a situation is high. In contrast, a person does not look for and generally does not need information that he processes. He may take it in, however, as a means of passing time—such as reading a magazine while waiting for an appointment or watching television when there is nothing else to do.

He may also simply enjoy processing information, such as when he reads a novel or watches TV.

The distinction between information seeking and processing is important in choosing a medium and communication strategy to reach publics. If a person seeks information, specialized media such as booklets, magazines, newsletters, or seminars are most effective. When a person processes information, the most effective media are mass or generalized media which people use when they have available time (see Grunig, 1979b). Style and creativity are important in facilitating information processing because a message must get a person's attention and keep his interest if he is to process the information. Style and creativity are not as important for information seeking because the person then makes an effort to obtain and understand the message.

Information processing, in other words, often takes place randomly. That does not mean, however, that its probability will be uniformly high. A person with a low level of involvement will be more likely to process information if he also has high problem recognition and low constraint recognition. Presence of a referent criterion should also increase the likelihood of information processing, as it would predispose a person to pay attention to a message coming to him randomly. The probability of information processing will start at a moderate level regardless of the other variables, because it is partly random. Its probability then will increase as the other variables become more favorable.

The four independent variables of the theory can be combined into a typology of 16 kinds of perceived situations and their accompanying communication behaviors. The 16 kinds of situations are the four basic situations defined above—problem facing, constrained, routine, and fatalistic—further broken down by high and low involvement and presence or absence of a referent criterion. The typology closely resembles definitions of publics in the literature that state that publics arise in issue-oriented situations. For example, Blumer (1946: 46) defined a public as a group of people (a) confronted by an issue, (b) divided in their ideas as to how to meet the issue, and (c) engaging in discussion over the issue. Blumer's definition of a public is similar to Dewey's (1927): A public arises when a group of people (1) faces a similar indeterminant situation, (2) recognizes what is indeterminate in that situation, and (3) organizes to do something about the problem.

Dewey's three conditions for the existence of a public can also be conceptualized as three types that develop in the evolution of active publics. When a group is in an indeterminate situation but does not recognize the situation as problematic, the group can be called a *latent public.* When the group recognizes a problem—what is missing in the situation—the latent public becomes an *aware public.* When the public organizes to

TABLE 1
Communication Behavior Typology

	High Involvement (HI)		Low Involvement (LI)	
	Behavior Type	Type of Public	Behavior Type	Type of Public
Problem Facing Behavior (PF)				
with referent criterion (R)	HI, PF, R	Active	LI, PF, R	Aware
without referent criterion	HI, PF	Active	LI, PF	Aware
Constrained Behavior (CB)				
with referent criterion (R)	HI, CB, R	Active	LI, CB, R	Latent/Aware
without referent criterion	HI, CB	Active	LI, CB	Latent/Aware
Routine Behavior (RB)				
with referent criterion (R)	HI, RB, R	Active (Reinforcing)	LI, RB, R	None/Latent
without referent criterion	HI, RB	Latent	LI, RB	None/Latent
Fatalistic Behavior (FB)				
with referent criterion (R)	HI, FB, R	Latent	LI, FB, R	None
without referent criterion	HI, FB	Latent	LI, FB	None

discuss and to do something about the situation, it can be called an *active public*. Table 1, then, describes the 16 combinations of the four situational variables and places each into one of the three types of publics developed from Dewey's definition.

A Situational Theory and Environmental Publics

The proposition that different environmental situations bring forth different publics seems to explain the results of studies cited earlier. For example, studies which show that publics are concerned about environmental issues but do little to learn more about the environment or to take action to solve environmental problems seem to indicate that most people do not perceive an involvement in these issues, that they are not members of environmental publics as defined here. Environmentalists, however, recognize environmental problems—and personal involvement—and thus constitute active publics. The knowledge gap between the latent and active publics disappears, however, when an environmental problem involves most people living in a community.

The distinction between information seeking and processing and its relationship to level of involvement also explains studies which show that serious environmentalists do not rely on the mass media for environmental information. Rubin and Sachs (1973: 112) surveyed 301 members of the Sierra Club and found that only 18 percent said they used the mass media for ecology information. More important sources for them were conservation groups and clubs, knowledgeable friends and other individuals, and the academic community. Likewise, Novic and Sandman (1974) found that college students who used non-mass media more than mass media for environmental information considered themselves more informed, considered the environment a more important problem, and showed a strong relationship between being informed about the environment and making a personal commitment to do something about it.

Thus, the situational theory seems to explain many of the problems and research results related to environmental communication behaviors. In previous research (Stamm and Grunig, 1977; Grunig and Stamm, 1979; Grunig, 1979c) the theory also has been used to explain the presence or absence of cognitive effects of communication behaviors. In general, this research has shown that the situational theory can predict when people will hold "a" cognition but it cannot predict when they will hold a particular cognition. This finding follows logically from the teleological nature of the theory. The theory predicts when people will communicate and think enough about a situation to develop a cognition. But each individual controls what that cognition will be, making it extremely difficult—if not impossible—to predict what the direction of that cognition will be. In the previous research a theory of cognitive strategies was

developed and the situational theory used to predict the situations in which people would hold one or more of these strategies. The research has been limited to the cognitive component of attitudes, similar to Fishbein and Ajzen's (1975) "beliefs," although it seems likely that people will formulate evaluations (affective attitudes) and behaviors in the same situations as they will develop cognitions.

The concept of cognitive strategies grew out of efforts (see for example, Stamm and Grunig, 1977) to apply the cross-situational attitude framework to conservation issues. Two attitudes toward scarcity were derived from the conservation literature. This literature suggested that individuals hold one of these two "attitudes" and apply that attitude consistently for different conservation issues.

The first of these "attitudes," reversal of trends, represents the position that a scarce resource could be saved by using less of the resource—by reversing a trend toward scarcity. For example, a reversal of trends solution for the energy crisis would be to use less gasoline. The second "attitude," functional substitution, represents the position that a scarce resource should be replaced by an equivalent resource. Thus, the solution for the energy crisis would be to use gasohol or coal as a petroleum substitute. Environmentalists were expected to hold the reversal of trends position and nonenvironmentalists to hold the functional substitution position. Stamm and Bowes (1972) did find that people often applied the two positions across issues, but they also found that individuals sometimes held both positions for an issue even though the positions seemed incompatible. In other cases, individuals switched their positions from one issue to another. To explain these anomalies, two types of cognitive stategies, hedging and wedging, were conceptualized. A person hedges when he supports more than one solution to a problem. He wedges when he supports only one solution to a problem.

Previous research (Stamm and Grunig, 1977; Grunig 1979c; Grunig and Stamm, 1979) showed that the situational variables predict when a person will have a cognitive stategy, just as they predict when he will communicate. In addition, the research has shown that people tend to apply the reversal of trends solution across situations as a referent criterion—and wedge—unless they perceive an involvement in the situation. Then they combine reversal of trends with the functional substitution criterion and hedge. For example, most people do not feel involved with the whale extinction issue and generally say the solution for the problem is simply to stop killing whales. On the other hand, most feel involved with the energy crisis and believe the solution is both to cut down on energy consumption and to develop new energy sources. This latter result again seems consistent with the frequent research finding that concern for the environment abates when a person becomes personally involved.

In light of the hedging and wedging concepts, the traditional objective of environmental communication programs—development of a cross-situational environmentalist attitude—seems unrealistic. To create an environmentalist attitude when a person holds an anti-environmental attitude would probably require a change from hedging to wedging in a pro-environmental direction or from wedging against the environment to wedging in favor of the environment. Environmental research also shows that people most often wedge against an environmentalist solution when they are involved in a situation, which is precisely the condition in which a complete attitude change is least likely to occur. The most likely kinds of attitude effects, then, would be a change from wedging against the environmentalist position to hedging (seeing both points-of-view), maintenance of hedging, or providing a person with a cognition when he or she had none.

Conceptualization of the Two Studies

The preceding theoretical discussion argued that the frequent research finding of an inconsistent relationship between environmental attitudes and behavior cannot be resolved within the theoretical framework of the latent process concept of attitude. The literature review showed, in contrast, that most of the recent attempts to resolve the attitude-behavior anomaly have pointed toward a situational theory. This would suggest that the time has come to develop a truly situational theory of communication behaviors and attitudes.

Recent research in the philosophy of science shows that, in the history of science, scientists generally have judged one theory to be better than another when that theory was able to solve the most empirical and conceptual problems in a given research domain (Laudan, 1977; Grunig, forthcoming). The problem-solving capability of a theory is even more important than the "truth" of a theory (Suppe, 1977: 701-702). Truth is important, but it is a necessary rather than a sufficient condition for acceptance of the theory. Scientists will not accept a theory unless it can be supported by empirical evidence, but several contradictory theories can be supported by research evidence and thus be "true." What the best theory must do is solve the problems that the other theory can solve and also solve problems the other theory cannot solve. It is especially important that a theory solve anomalous and conceptual problems (Laudan, 1977; Kuhn, 1970; Brown, 1977). The conceptual discussion in this monograph suggests that the situational theory solves more of these problems than does the classical, cross-situational attitude theory and that it should be a strong candidate for planning communication programs such as programs about the environment. For further development of these ideas see Shapere (1977).

Before a claim can be made for the superiority of a theory, however, it must be grounded in reality—shown to be true. The situational theory has been supported in previous research (Grunig, 1975, 1976, 1978, 1979c, 1979d, 1982; Grunig and Disbrow, 1977). The two studies reported in this monograph should provide an additional test of the theory and also make it possible to use the theory to identify environmental publics and develop communication strategies for the publics. Thus, the studies reflect what has been called applied basic research (Grunig 1979a)—research designed to test and improve a basic theory of communication while applying the theory to a practical problem of concern to professional communicators.

Three hypotheses and three research questions were developed for these studies. The hypotheses predict a relationship between variables suggested by the situational theory. The research questions merely ask the extent to which one or more variables exist in environmental publics.

The first two hypotheses state the basic relationships of the situational theory described above:

H1: Problem recognition and level of involvement will correlate positively and constraint recognition and presence of a referent criterion will correlate negatively with information seeking.

H2: Problem recognition will correlate positively, constraint recognition and presence of a referent criterion will correlate negatively, and level of involvement will not correlate with information processing.

The third hypothesis basically states that Table 1 will be supported by probabilities of information seeking and processing calculated from empirical data. The table, with 16 categories and two dependent variables, however, is too complicated to describe as a single hypothesis. Thus Hypothesis 3 is a shorthand hypothesis. Table 1 can be related to Hypothesis 3, however, if one recognizes that active publics have high probabilities of both information seeking and processing, aware publics moderate probabilities of information seeking and moderate to high levels of information processing. Latent publics have low probabilities of information seeking and moderate probabilities of information processing. Non-publics ("None" in Table 1) have low probabilities of both information seeking and processing.

H3: The 16 combinations of the four situational variables will be associated with conditional probabilities of information seeking and processing that could be expected of latent, aware, and active publics as described in Table 1.

The three research questions were developed to use the situational theory to determine the nature of environmental publics, the cognitive strategies used by these publics to resolve environmental issues, and the demographic characteristics of different environmental publics.

Q1: What publics arising from different environmental issues will the

situational variables define, and will the communication behaviors of these publics be consistent with the predictions of the situational theory?

Q2: What cognitive strategies will the publics (defined by the situational variables) use to resolve different environmental issues?

Q3: Will members of each of the publics (defined by the situational variables) have similar demographic and personal attributes or will the publics consist of people with different demographic and personal attributes?

Methodology

Two separate samples were developed as a result of two grants from the National Wildlife Federation, the first in 1976 to define urban environmental publics and the second in 1977 to define rural publics. Financial limitations made it impossible to construct random national samples, so samples were developed following the logic of Stephenson's (1953) Q-methodology, in which respondents are chosen to represent theoretic conditions. Although there is logical reason to believe the results of these studies can be generalized to the national population, it is not statistically possible to make that generalization.

For the urban study, interviews were conducted in the metropolitan regions of four major cities: Washington, Baltimore, Chicago and Cleveland. All sampling within these four metropolitan areas was done through random digit dialing. To insure that people experiencing industrial air pollution were included in the sample, telephone exchanges from areas surrounding steel mills and industrial plants were overrepresented in the Baltimore, Chicago, and Cleveland samples. Finally, in order to insure inclusion of young, well-educated people and environmental scientists, interviews also were conducted with University of Maryland students and scientists randomly drawn from the University telephone directory. The total sample size was 231.

For the rural study, a purposive sample of nine rural communities in three states was developed. Five of these communities were in Maryland, chosen to represent the diverse cultural and economic sections of the state—the Eastern Shore, Southern Maryland, Northern Maryland, and the western Appalachian region. Two additional communities were chosen from Missouri and two from the state of Washington. Twenty-five residents were chosen by random digit dialing from each of these nine communities, for a total sample of 225. All interviewing was done by telephone in both studies. Nonresponse, checked in the second study, was 20 percent of attempted calls.

Eight environmental issues were used for the situational perception and communication behavior variables in each study. Air pollution, the

extinction of whales, the energy shortage, and strip mining were used in both studies. Superhighways in urban areas, disposable cans and bottles, water pollution, and oil spills were used only in the urban study. Dams and flood control projects, effect of pesticides on wildlife, fertilizer run-off in lakes and streams, and nuclear power plants were used only in the rural study.

The four situational variables were measured in essentially the same way in the two studies, although experience with the measures in the first study and in similar research was used to improve the wording for the second study. In particular, a four point self-administered rating scale was used in the second study, a dichotomous scale in the first. The wording used to determine the presence of a referent criterion also was broadened in the second study, although as noted below, the first measure now seems better.

Thus, for each of the eight issues, respondents were asked: (1) Do you stop to think about this problem often, sometimes, rarely, or never? (problem recognition); (2) Do you see a strong, moderate, weak or no connection between yourself and this problem? (level of involvement); and (3) Could you do a great deal, something, very little, or nothing personally to affect the way these issues are handled? (constraint recognition). In the urban study referent criterion was measured by asking: Do you know a solution to this problem? In the rural study, referent criterion was measured by the following questions: Do you have a great deal of knowledge or experience that would help you make judgments about these issues, some knowledge or experience, very little, or none? A different wording was used in the second study because "a solution to a problem" may be only one type of referent criterion. The wording in the second study, "knowledge or experience related to the problem," was used because knowledge or experience was assumed to be a necessary condition for referent criterion and because this wording would pick up referent criteria other than solutions. However, "knowledge and experience" has turned out to be a better measure of actual knowledge than of the presence of a referent criterion and, for this reason, respondents in a later study (Grunig 1978) were asked "how definite an idea" they had of what to do about each problem.

Three dependent communication variables were measured in each study: information seeking, information processing, and knowledge of actual environmental news appearing in the mass media. Information seeking was measured by presenting respondents with a list of eight hypothetical titles of brochures matching each of the eight problems. Respondents gave a number between 0 and 10 to indicate how likely they would be to send for such a brochure. To measure information processing, respondents were given eight hypothetical newspaper leads and were

asked how likely (on the 10-point scale) they would be to read the article if they came across it in a newspaper. This is the title-rating technique developed by Haskins (1960). Stevenson (1973) found title ratings correlated well with actual readership in several studies. Knowledge of news items was measured by asking true-false and multiple choice questions, such as "which country is currently killing whales, Japan or China." In the rural study, these items were chosen to fit each situation; in the urban study they did not specifically relate to the eight situations.

Because members of active publics can be expected to join environmental organizations, respondents in the urban study also were presented with a problem fitting the eight situations and asked how likely they would be to join an organization to do something about the problem. Also in the urban study, a fifth dependent variable, the "idea" that would result from communication, was included. This variable thus made it possible to distinguish cognition from attitude. The idea was measured by asking respondents what word came to mind when the interviewer read them a word related to each of the eight situations. Responses were scored so that a low score meant a person did not think of any word related to the environment, followed by a word related neutrally to the environment, followed by a word indicating the environment was deteriorating.

Because of time limits on a telephone interview, the cognitive strategy variables were measured only for three issues in each study: the energy crisis in both, superhighways and water pollution in the urban study, and fertilizer run-off and the whale extinction in the rural study. Functional substitution and reversal of trends were measured by asking respondents to choose a number between 0 and 10 to indicate their agreement with each solution. For example, for energy, they rated their agreement with "finding other sources of energy to replace gasoline" (functional substitutes) and "cutting back on people's use of automobiles" (reversal of trends). Wedging scores were the absolute value of the difference between the two ratings. Hedging scores were computed by adding the two scores and subtracting the absolute value of their difference (to eliminate the possibility that a high score on one and a low score on the other would give the same value as a moderate score on both).

The time limitations of a telephone interview made it necessary to limit measures of all of these variables to single questions, especially since each question was repeated for eight issues. In addition, the measures of the situational variables and the cognitive strategy variables appear to be operational definitions of the concepts they measure, as opposed to operational indicators. Operational definitions bear a one-to-one relationship to a concept and thus carry the same amount of meaning but in operational rather than theoretical terms. Operational indicators, on the other hand,

do not define a concept. They indicate the presence of a concept. Several operational indicators, therefore, could be used to indicate the presence of the same concept. Multi-item attitudinal scales, for example, generally consist of several operational indicators.

A researcher generally cannot include more than one operational definition (as defined here) in the same study, as only minor changes in wording can be made from one definition to another. Thus, a respondent rightfully would feel that he has been asked the same question more than once. The measures of information seeking and processing used here do appear to be operational indicators, and multi-item measures would have been desirable. Again, however, this was not feasible because of the large number of items that would be needed for multi-item scales on eight different environmental problems.

Multiple regression analysis was used to test Hypotheses 1 and 2, which related the four situational variables to information seeking and processing. Standardized Beta weights served as the test of the hypotheses. Because of intercorrelation between the four situational variables and the resulting possibility of multicollinearity, ridge regression, as developed by Hoerl and Kennard (1970), was used to compute the regression coefficients. Ridge regression reduces the inflated variance of regression coefficients and the unstable coefficients that result by introducing bias in order to reduce the mean square error of the regression equation.

Hypothesis 3 predicted that combinations of the four situational variables would be associated with conditional probabilities of information seeking and processing consistent with the concepts of latent, aware, and active publics. That hypothesis was tested by dichotomizing the situational and communication variables and calculating conditional probabilities of information seeking and processing associated with each of the 16 kinds of communication behavior described in Table 1. The situational variables were dichotomized at the midpoint of the scale; the communication variables were dichotomized at the mean value for all information seeking and processing variables (approximately 6 on the 10-point scales for both studies). Each situation was treated as a single unit of analysis in calculating these probabilities. Thus, there were 1,848 situations in the urban study (8 situations for 231 respondents) and 1,800 situations in the rural study (8 x 225).

The first research question, which asked what publics the situational variables would isolate, was addressed through the use of canonical correlation. Several past studies in which the situational theory was used to isolate publics (Grunig, 1978, and Grunig, 1979c) used Q factor analysis to define publics. Q factor analysis correlates people rather than variables and places the people into types based upon their similarity on all

variables measured. Q analysis does not distinguish independent from dependent variables, however, and thus it loses much of the conceptualization of the situational theory. Canonical correlation operates much like factor analysis (Levine, 1977). It develops canonical variates that are similar to factors, but canonical variates distinguish independent and dependent variables. Thus, it was possible to correlate the situational variables for the eight issues with the communication variables for the same eight issues. The result was a set of canonical variables that represent publics that have developed from the eight issues. Some publics may be active on two or more issues and aware or latent on others. The canonical variates indicate how the issues cluster for different publics. For examples of related previous research using canonical correlation, see Grunig (1977b) and Grunig (1979d).

The last two research questions were addressed by placing respondents into publics based upon the canonical variate for which they had the highest canonical variate score. Respondents below the mean on all canonical variates were placed into a no-public category. To answer the research question on the cognitive strategies used by each public, scores of respondents on the cognitive strategy variables were broken down by publics, and one-way analysis of variance was used to determine significant differences between publics.

To answer the research question on demographic differences between publics, discriminant analysis was used to determine if a set of demographic variables, environmentally related activities, and—in the rural study—two broad environmental "attitudes" could discriminate the publics from one another.

Results

Although different situations bring forth different publics, as defined here, it is possible that some situations will bring forth the same publics as others. To check for this possibility, the first step in the data analysis was to factor analyze the eight environmental situations separately for each of the four situational variables and for information seeking and processing. For each of these six factor analyses, half of the situations loaded on one factor and half loaded on a separate factor or had low communalities. For subsequent analyses, therefore, the variables loading on the principal factor were added into a "general environmental situations" scale. For the urban sample, the issues added into this general situations scale included extinction of whales, disposable cans and bottles, strip mining, water pollution, and oil spills. The other three issues—air pollution, energy, and superhighways—were treated as separate issues. For the rural sample, the dam and flood control, strip mining, pesticides, water pollution, and nuclear power plant issues went into the general

situations scale. The air pollution, energy, and whale issues were treated separately.

Although there does not seem to be an immediately apparent reason why some of the issues correlated with one another and others did not, close examination does reveal some meaningful consistency in the two samples. For both samples, two of the three separate issues yielded the highest involvement and problem recognition scores of all issues. These two issues were air pollution and energy, the environmental issues that most involve the average person. They emerged as separate issues because nearly everyone is part of an active public for these two issues. Superhighways, in the urban study, probably emerged as a separate issue because it is a special-issue problem. The people most concerned are those likely to lose their homes or to have their neighborhoods affected. Generally, superhighways did not seem to be an issue of great concern to environmentalists.

Whale extinction probably emerged as a separate issue for the rural sample because it yielded the lowest level of involvement and problem recognition of all issues. Whale extinction also produced the lowest problem recognition and involvement scores for the urban sample, although the problem recognition score (47.3 percent) was higher than for the rural sample (32.0 percent). This suggests that environmentalists in urban areas include whale extinction among their pet issues. Level of involvement in the whale issue, on the other hand, was higher in the rural areas than in the urban areas, probably because of the water orientation in the rural Chesapeake Bay region of Maryland. That higher involvement—of a relatively small part of the rural sample—thus seems to explain why whales brought forth a separate public for the rural sample but not for the urban sample.

The issues included in the general environmental issues scale generally resulted in high involvement and problem recognition for about half of the respondents in both samples, although disposable cans and bottles and water pollution were in the 80 percent range. These two issues, however, still appealed to somewhat fewer people than did air pollution and energy. The general situations scale thus seems best understood as representing those issues of concern to active environmentalists but of less concern to non-environmentalists, probably because the general issues involve people less directly than do air pollution and energy. Again, however, cans and bottles and water pollution seem to fall in the margin between being an environmentalist issue and an issue for which nearly everyone is part of an active public.

Table 2 also shows that for all issues combined more people recognize environmental problems than feel involved with the problems; especially in the urban sample, in which 76 percent (as opposed to 64 percent in the

TABLE 2
Percentage of Respondents in Four Categories
By Type of Environmental Issue

	Recognize Problem		Involved in Situation		Face Constraints		Have Referent Criterion	
	Urban[1]	Rural[2]	Urban	Rural	Urban	Rural	Urban	Rural
All Issues	76.4	64.2	60.2	57.9	53.4	65.8	48.3	48.1
Air Pollution	95.2	87.1	85.6	76.8	49.7	44.9	45.0	69.8
Extinction of Whales	47.3	32.0	10.4	22.7	71.7	89.8	43.3	20.4
Energy Shortage	96.3	92.6	92.3	87.0	39.4	40.0	50.2	76.5
Strip Mining	53.4	40.1	25.6	33.9	70.2		30.7	31.9
Superhighways in Urban Areas	67.2	--	61.9	--	61.6	--	41.5	--
Disposable Cans and Bottles	81.5	--	82.8	--	23.3	--	73.6	--
Water Pollution	91.8	--	77.8	--	39.0	--	58.8	--
Oil Spills	79.7	--	45.4	--	70.2	--	43.3	--
Dams and Flood Control Projects	--	47.5	--	48.9	--	78.2	--	44.8
Effect of Pesticides on Wildlife	--	73.8	--	67.1	--	52.0	--	50.5
Fertilizer Run-off	--	71.1	--	66.6	--	58.7	--	50.5
Nuclear Power Plants	--	69.3	--	60.0	--	75.9	--	40.3

[1]Based on a dichotomous scale, n=231.
[2]Four-point scale collapsed to a dichotomous scale, n=225.

rural sample) recognized environmental problems. Level of involvement was about the same for both samples, however. This suggests that rural people less often recognize environmental problems unless they are directly involved than do urban people who more often recognize problems that do not involve them. This would also suggest that urban people are more likely to be general environmental activists than are rural people. Table 2, finally, shows a great deal of variance in the four situational variables across issues, thus supporting the situational conceptualization of the theory. Given these preliminary analyses, we can now turn to specific hypotheses and research questions.

Hypotheses 1 and 2. Hypothesis 1 stated that problem recognition and level of involvement would be positively related to information seeking and that constraint recognition and presence of a referent criterion would be negatively related. Hypothesis 2 predicted the same relationship with

information processing for problem recognition, constraint recognition, and presence of a referent criterion. It added, however, that level of involvement would not be associated with information processing.

TABLE 3

Ridge Regression Analysis for General Situations Variables

	Beta Weights	
	Information Seeking	Information Processing
Problem Recognition		
Urban Sample	.15*	.29**
Rural Sample	.22**	.18**
Constraint Recognition		
Urban Sample	-.26**	-.21**
Rural Sample	-.25**	-.04
Level of Involvement		
Urban Sample	.08	.04
Rural Sample	.11	.15
Referent Criterion		
Urban Sample	-.07	-.03
Rural Sample	.04	.15
Adjusted R^2		
Urban Sample	.14**	.19**
Rural Sample	.25**	.19**

*$p < .05$

**$p < .01$

Table 3 presents the results of a multiple regression analysis using the added "general environmental situations" measures of the six theoretical variables. These added variables had scaling properties better suited to regression analysis than the measures of the six variables for the three specific issues not added into the general scale. The regression coefficients in Table 3 generally support the hypothesized relationships between the situational variables and information seeking and processing, as they also did in Grunig (1975) and Grunig and Disbrow (1977). The four regression equations are both significant at the 1 percent level (for information seeking and information processing in rural and urban samples) and explain 15 to 25 percent of the total variance. The Beta weights are moderately high and in the expected direction for problem recognition and constraint recognition. They are insignificant, however, for level of involvement and referent criterion.

Level of involvement, of course, was hypothesized not to have a significant relationship with information processing. It should have been positively related to information seeking, however. As the two coefficients are positive and do approach significance, the best explanation for why they are not larger probably lies in the intercorrelation with the other variables, especially with problem recognition. As problem recognition already accounts for most of the variance explained by level of involvement, the coefficients for involvement reflect only the additional contribution of involvement. That contribution is small, even though ridge regression corrects for some of the problems of multicollinearity. In the urban sample, for example, involvement correlated .27 (Pearson's r) with information seeking and .20 with processing, thus showing an independent contribution for involvement that is largely wiped out in the regression analysis.

Single equation regression analysis thus does not seem to be capable of fully capturing the situational theory, as it does not allow for interaction between the independent variables of the theory. The interaction that shows up in the data could be viewed as merely bothersome, or it could be viewed as theoretically meaningful. Level of involvement, for example, could be hypothesized to increase problem recognition, which could in turn increase information seeking and processing. Or problem recognition could increase perceived involvement, which could then increase information seeking. Those relationships have been conceptualized using simultaneous equations in Grunig (1979d). These interrelationships probably account for the mixed support that the multiple regression analysis provided for the theory here.

The insignificant results for referent criterion require a different explanation. In the urban study, as expected, the presence of a referent criterion had a negative relationship with information seeking and processing, although the Beta weights were not significant. In the rural study, the presence of a referent criterion had a positive relationship (although insignificant) with both communication variables, but especially with information processing. The change from a negative to a positive relationship could have occurred because of the change in the measure for this variable—from "having a solution" to "having knowledge and experience." "Having a solution" now appears to be a better measure of the presence of a referent criterion. It also appears that the same conditions that produce communication behavior—the presence of other situational variables—also produce a referent criterion. Therefore, it becomes difficult to separate the spurious correlation of the presence of referent criterion with the communication variables from the negative, casual effect that a referent criterion has on communication behavior. The earlier discussion of Grunig and Stamm (1979) is relevant here.

Hypothesis 3. Hypothesis 3 predicted that conditional probabilities associated with the 16 combinations of the four situational variables would closely match those expected of active, aware, latent and non-publics as described in Table 1. A conditional probability is a relative frequency that occurs given a special antecedent conditon. In Table 1 there were 16 special conditions. Hypothesis 3, therefore, basically tests the same theoretical relationships as did the first two hypotheses but makes it possible to capture more of the interaction of the four independent variables of the theory.

Table 4 combines the data from the two studies, under the assumption that the observed relative frequency will get closer and closer to the true probability as one observes more and more situations. There were eight situations measured for 231 people in the urban study, or a total of 1,848 situations. There were eight situations measured for 225 people in the rural sample, or 1,800 situations. Thus, there were a total of 3,648 situations distributed over the 16 categories of Table 4. The probabilities in Table 4 reflect the percentage of situations falling into each category for which information seeking or processing was above the mean.

TABLE 4

Conditional Probabilities of Information Processing and Information Seeking

	High Involvement		Low Involvement	
	Information Processing	Information Seeking	Information Processing	Information Seeking
Problem Facing				
Behavior				
Referent Criterion	75%	59%	59%	52%
No Referent Criterion	73%	53%	68%	47%
Constrained				
Behavior				
Referent Criterion	62%	50%	59%	35%
No Referent Criterion	62%	45%	55%	33%
Routine Behavior				
Referent Criterion	62%	54%	54%	34%
No Referent Criterion	44%	44%	44%	42%
Fatalistic Behavior				
Referent Criterion	48%	35%	43%	22%
No Referent Criterion	34%	14%	33%	15%
	Information Processing	Information Seeking		
All Situations	58%	41%		
Number of Situations	3648			

Table 4 shows, as the theory predicted, that the highest probabilities of information seeking and processing were in the high-involvement problem facing and constrained behavior conditions, both described in Table 1 as behaviors characteristic of active publics. The lowest probabilities were for low-involvement, fatalistic behavior, for which Table 1 indicated no publics would be found.

The conceptualization of the situational theory stated that high involvement would increase the probability of information seeking but that it would have no effect on the probability of information processing. Table 4 mirrors that pattern. Probabilities of information seeking are higher across all conditions for high involvement as opposed to low involvement. The probability of information processing is approximately the same under the same conditions, regardless of level of involvement.

The probability of information seeking in the routine behavior category also supports the theoretical statement that this combination of variables provides the necessary conditions for cognitive dissonance and the seeking of reinforcing information, especially when involvement is high and a referent criterion is present. In other words, a person perceiving a situation in this way does not think about the issue, feels he knows what to do, and feels involved with the issue. Then he seeks information to reinforce his referent criterion. The high probability of information seeking in the high involvement, routine behavior, referent criterion cell of Table 4 supports this conceptualization.

The difference in probabilities between the referent criterion and nonreferent criterion conditions for each category (for example, high-involvement, problem-facing behavior) reinforces the regression results that showed the referent criterion to have little relationship to the communication variables. Indeed, Table 4 shows there is generally *more* communication behavior when a referent criterion is present. As discussed above, the referent criterion probably correlates positively with communication because it too occurs as a function of problem recognition, involvement, and constraint recognition, rather than because it causes communication behavior to occur.

Research Question 1. This research question asked what environmental publics the canonical correlation analysis would identify. It then asked if the dependent communication variables would correlate with the independent situational variables in patterns compatible with the theory.

Tables 5 and 6 show that five canonical variates were significant at the .05 level (based on Wilks lambda) in the urban study and that four variates were significant in the rural study. Tables 5 and 6 then can be used to define each of these variates and, in doing so, to describe an environmental public. The tables contain a Pearsonian correlation coefficient that represents the strength of association between each variate

and the four independent and dependent variables measured for the general environmental situations scale and for each of the special issues. Pearsonian correlations rather than canonical variate coefficients are reported here following the advice of L evine (1977: 18-20).

Levine suggested using correlation coefficients rather than canonical coefficients to interpret variates because the correlations indicate how strongly each variable is associated with a variate. The canonical coefficients, in contrast, indicate the independent contribution of each variable after controlling for other variables. Canonical coefficients can be misleading when collinearity occurs. If two variables are correlated, one may have a low coefficient even though it is strongly correlated with the variate. L evine compared these two methods of assessing the importance of each variable to a variate with the difference between factor loading and factor score coefficients. Factors can be interpreted much more easily with factor loading than with factor score coefficients because the factor score coefficients are designed to compute factor scores and not to show how strongly each variable is associated with the factor.

Both the urban and the rural samples yielded canonical variates that suggest a general environmentalist public. People with high scores on this variate would make up the activists with whom both pro- and anti-environmental organizations must deal. For the "general environmental" situations, Tables 5 and 6 show both urban and rural environmentalists to be in what Table 1 calls the high-involvement, problem-facing situation with a referent criterion (HIPF*R*). That is, level of involvement, problem recognition, and referent criterion are high and constraint recognition is low. Table 4 thus shows the environmentalists to have a 75 percent probability of processing and a 59 percent probability of seeking general environmental information. The bottom halves of Tables 5 and 6 (which contain the dependent variables) confirm this probability. Both the urban and the rural environmentalist variates have high correlations with information seeking and processing and with knowledge. In addition, the urban environmentalist variate has a high correlation with having an "idea" and with joining organizations. (These two variables were not included in the rural study.)

Tables 5 and 6 also show that the environmentalists make up active publics for the special environmental situations as well as the general situations. The urban environmentalists fall into the HIPFR category also for the air pollution, superhighway, and energy issues and generally have correspondingly high scores on all of the dependent variables. The same is true for the rural environmentalist public on the energy and air pollution situations (although problem recognition is only moderate for air pollution). The rural environmentalists, however, have little concern for the whale issue as the correlations on both the independent and dependent variables are approximately zero.

TABLE 5

Canonical Correlation of Situational Perception Variables With Communication, Cognitive, and Knowledge Variables for the Urban Sample

	Pearson's Correlation with Variate				
	Direct Consequences Variate	General Environmentalist Variate	Superhighway Variate	Unconcerned Variate	Air Pollution Variate
Situational Variables					
General Environmental Situations:					
Problem Recognition	.27	.81	.16	.18	-.21
Level of Involvement	.07	.67	.12	-.14	-.22
Constraint Recognition	.32	-.71	-.01	-.07	-.19
Referent Criterion	-.25	.67	-.21	-.15	-.06
Air Pollution Situation:					
Problem Recognition	.68	.29	-.13	-.01	.38
Level of Involvement	.33	.15	.31	-.21	.02
Constraint Recognition	.46	-.51	-.08	-.17	-.03
Referent Criterion	-.64	.41	-.18	-.20	.28
Superhighway Situation:					
Problem Recognition	.30	.27	.37	-.29	-.05
Level of Involvement	.24	.16	.33	-.51	.02
Constraint Recognition	.57	-.47	-.19	.18	.03
Referent Criterion	-.32	.38	.18	-.60	.18
Energy Situation:					
Problem Recognition	.47	.10	-.41	-.39	-.25
Level of Involvement	.36	.24	-.56	-.24	-.11
Constraint Recognition	-.14	-.24	-.04	-.25	.13
Referent Criterion	.34	.37	-.22	.04	.11
ommunication/Cognitive Variables					
General Environmental Situations:					
Information Seeking	.06	.50	.12	.22	.35
Information Processing	-.35	.59	.06	.47	-.04
Idea	.31	.58	-.04	.44	.01
Join Organizations	.01	.61	.38	-.07	.27
Air Pollution Situation:					
Information Seeking	-.24	.44	-.23	.06	.17
Information Processing	-.25	.30	-.04	.44	.01
Idea	-.32	.11	.07	.06	.24
Join Organizations	-.87	.30	-.09	.01	.20
Superhighway Situation:					
Information Seeking	-.30	.36	.09	-.03	.17
Information Processing	-.08	.37	.16	.02	-.22
Idea	.24	.00	.12	-.26	.38
Join Organizations	.09	.19	.52	.02	-.22
Energy Situation:					
Information Seeking	-.43	.18	-.09	.19	.04
Information Processing	-.28	.07	-.18	.00	-.22
Idea	-.23	.20	.15	-.15	-.04
Join Organizations	-.12	.26	-.15	-.02	.28
Knowledge	.22	.61	-.01	.12	-.39
Canonical Correlation	.81	.71	.52	.47	.42
Chi Square	687.63	459.60	308.16	242.08	188.91
	272df	240df	210df	182df	156df
	.001	.001	.01	.01	.05

Research Question 1 not only asked what publics canonical correlation would identify but whether the relationships between the independent and dependent variables would confirm the theory. For the general environmentalist variates, the canonical correlation results quite clearly display the expected relationships.

The other variates in both studies describe special environmental publics that form around the more involving issues that did not factor into the general environmental situations scale. The exceptions are the Unconcerned Variate in the urban sample and the Whale Extinction Variate in the rural sample, which will be explained below. Energy stands out as the most prominent special issue. (Remember that about 90 percent of both samples had high problem recognition and involvement on this issue.) Energy was the only issue of concern to the rural Energy Public and was the most important issue for the urban Direct Consequences Public. "Direct Consequences" was chosen as the name for this variate in the urban sample because level of involvement was higher for the three special issues than for the general situations scale.

In contrast to the theoretical expectations, these two publics did not display much communication activity on the energy issue, nor on any of the other issues. The best explanation seems to be their high level of constraint recognition on most of these issues and their tendency not to have a referent criterion. Thus energy, and the other direct consequences issues for the urban group, seem to involve people to the extent that many recognize the problem (although even that is not high for the rural sample). But these publics feel there is little they can do about the situations. Thus, they apparently perceive little need to seek or even to pay attention to (process) information about these issues that they recognize as involving them.

Both studies also identified a public concerned only about the air pollution issue. In both studies this air pollution public fell into the HIPFR category, although some of the correlations with the independent variables were not high. In addition, the correlations for the dependent variables were mixed, although generally supportive of the theory. There is little to suggest in Tables 5 or 6, however, that this air pollution public is an active one. Rather, it is an aware public that recognizes the problem but does not feel strongly enough about it to communicate about or do anything about it.

The superhighway public in the urban sample seems to be a somewhat more active public. It too is in the HIPFR category and its correlations with the communication variables are high. It is interesting, however, that this group is especially likely to join organizations to deal with the superhighway problem. The superhighway issue seems to be one for which publics immediately become active without passing through the

aware stage. When a highway threatens their neighborhood, they do not communicate to learn about the situation. They immediately move to protect their environment.

The last variate in Table 5 seems to describe an "unconcerned public" in

TABLE 6

Canonical Correlation of Situational Perception Variables With Communication and Knowledge Variables for the Rural Sample

	Pearson's Correlation With Variate			
	General Environmentalist Variate	Whale Extinction Variate	Air Pollution Variate	Energy Variate
Situational Variables				
General Environmental Situations:				
Problem Recognition	.59	.44	-.20	-.01
Level of Involvement	.65	.28	-.23	.03
Constraint Recognition	-.46	-.57	-.08	-.08
Referent Criterion	.58	.26	-.26	.01
Air Pollution Situation:				
Problem Recognition	.08	.00	.31	-.58
Level of Involvement	.40	.11	.40	-.20
Constraint Recognition	-.36	-.34	-.13	.07
Referent Criterion	.38	.31	.03	-.40
Energy Situation:				
Problem Recognition	.46	-.10	-.04	.08
Level of Involvement	.48	.00	.48	.23
Constraint Recognition	-.32	-.14	-.22	.20
Referent Criterion	.52	.07	-.06	-.12
Whale Situation:				
Problem Recognition	-.07	.71	-.04	-.34
Level of Involvement	.00	.54	-.31	-.07
Constraint Recognition	-.03	-.50	-.08	.20
Referent Criterion	-.13	.64	.17	.17
Communication/Knowledge Variables				
General Environmental Situations:				
Information Seeking	.60	.47	-.43	-.03
Information Processing	.33	.19	-.18	.07
Knowledge	.37	.23	.22	-.04
Air Pollution Situation:				
Information Seeking	.58	.21	.10	-.28
Information Processing	.38	.04	.02	-.73
Knowledge	.18	.18	-.18	.20
Energy Situation:				
Information Seeking	.55	.29	.22	.12
Information Processing	.54	-.08	.20	-.01
Knowledge	.34	.10	-.02	-.07
Whale Situation:				
Information Seeking	.07	.78	-.03	-.25
Information Processing	.00	.53	-.20	-.25
Knowledge	.10	.54	.40	-.01
Canonical Correlation	.66	.55	.41	.39
Chi Square	376.07	280.37	186.05	147.13
	192df	165df	140df	117df
	.001	.001	.01	.05

the urban areas sampled. The correlation coefficients indicate that this public is a "non-public" on all of these issues, although there is a small positive correlation for problem recognition on the general situations scale. The correlations with the communication variables suggest that this public will process environmental information on several issues—and, to a lesser extent, seek it—even though the public has little true concern for the environment. Similarly, this public also displays a small amount of environmental knowledge. These results are consistent with the theoretical statement that people will randomly process information and remember some of it even though they are not involved. That is why people so often agree with close-ended statements in polls that the environment is a serious problem. But this unconcerned public would not act upon this information and really does not constitute an aware or active public.

Finally, Table 6 contains a variate representing a special whale public in the rural area. This public falls into the HIPFR category on the whale issue and its information seeking, processing, and knowledge coefficients are all high on that issue. The whale public also seems to be a general environmental public as well, as it falls into the HIPFR category on the general environmental situations and has high scores on all of the dependent variables for that scale. Thus, the whale public seems to be a special sub-public of environmentalists, an interpretation supported by the fact that the whale issue was included in the general environmental issues scale in the urban study. The whale enthusiasts, in other words, seem to be environmentalists with a special concern for an issue that is not shared by all environmentalists.

Research Question 2. Having identified publics and classified them according to their communication behavior, we can now examine the cognitive strategies these publics employ for different environmental issues—the essence of Research Question 2. This was done by placing each respondent into the public for which he had the highest canonical variate score, as long as that score was above the mean. Respondents below the mean on all variates were placed into a no-public category. Scores on the cognitive strategy variables for three issues were then broken down by the publics. Tables 7 and 8 show the results.

These tables can be used simply to describe the "opinions" of each identified public, but they also suggest several generalizations. First, the strategies employed generally followed the issue more than the public. This was especially evident for the rural publics for which there were fewer significant differences between publics than there were for the urban publics. Generally, the publics believed hedging to be the appropriate strategy for the energy shortage and wedging, with reversal of trends as the single solution, to be the appropriate strategy for water pollution,

TABLE 7

Means of Cognitive Strategy Variables by Types of Publics for Urban Sample

	Total Sample (n=231)	Public Type[1]						
		Direct Consequences (n=30)	General (n=58)	Super-Highway (n=39)	Unconcerned (n=51)	Air Pollution (n=48)	None (n=5)	F
Water Pollution[2]								
Functional Substitution	3.88	5.43	2.98	3.33	3.51	4.75	4.60	2.75*
Reversal of Trends	8.39	7.83	9.07	8.23	8.78	7.80	7.00	2.13
Hedging	6.78	9.07	5.96	6.15	6.63	7.13	5.60	0.98
Wedging	5.49	4.20	6.09	5.41	5.67	5.42	6.00	1.01
Energy Shortage								
Functional Substitution	8.51	8.50	9.26	8.03	8.49	8.15	7.20	1.97
Reversal of Trends	5.65	6.10	6.78	5.61	5.67	4.19	4.20	3.03**
Hedging	10.36	11.07	13.45	9.59	10.09	7.67	4.80	4.59**
Wedging	3.81	3.53	2.59	4.05	4.08	4.67	6.60	2.50*
Superhighways								
Functional Substitution	2.71	3.47	1.88	1.67	3.40	3.46	2.00	2.92*
Reversal of Trends	6.71	6.33	6.81	7.64	5.55	7.19	7.60	2.32*
Hedging	3.68	4.93	3.14	2.21	4.16	4.21	4.00	1.72
Wedging	5.74	4.87	5.55	7.10	4.78	6.43	5.60	2.57*

*$p < .05$

**$p < .01$

[1]Range for hedging variables = 0-20, for all other variables = 0-10.

[2]Water pollution was one of the issues included in the general situations scale.

superhighways, fertilizer run-off, and whale extinction. That is, these data suggest that people opt for strong environmental controls—reversal of trends—until they must personally sacrifice something—as they would have to do to reverse the trend toward using up energy resources.

The tables also indicate that a public is likely to wedge on the issue that brought that public into existence, with reversal of trends as the preferred solution. The exception is the energy issue, which brings forth a public that otherwise would have no concern for the environment. In the urban sample, the "direct consequences public" was most likely to hedge on the energy issue. For the rural sample, the energy public fit the high involvement, constrained behavior category and did not communicate or have a referent criterion. As could thus be expected, this energy public had lower scores than other publics on both solutions to the energy issue. When members of this public did have a solution, however, they generally wedged, with functional substitutes as the preferred solution.

The "no-public" group also generally had one of the highest wedging scores on each issue. The wedged solution was reversal of trends for all issues except energy and fertilizer run-off. Apparently, when a person is not part of an environmental public he expresses a simple "stop doing it"

TABLE 8

Means of Cognitive Strategy Variables by Types of Publics for Rural Sample

	Total Sample (n=225)[2]	Public Type[1] General (n=52)	Whales (n=44)	Pollution (n=58)	Energy (n=52)	None (n=15)	F
Fertilizer Run-off[3]							
Functional Substitution	3.35	3.53	3.39	3.12	3.02	4.60	0.60
Reversal of Trends	4.67	4.79	4.93	5.26	4.13	3.13	1.96
Hedging	4.57	4.41	5.14	4.83	4.15	4.00	0.25
Wedging	3.50	3.91	3.45	3.55	3.00	3.73	0.55
Energy Shortage							
Functional Substitution	8.39	8.85	8.30	8.66	7.60	8.73	2.36*
Reversal of Trends	6.86	7.19	6.86	7.26	6.36	5.87	1.10
Hedging	12.48	13.47	12.41	13.52	10.91	10.66	1.96
Wedging	2.77	2.57	2.75	2.40	3.06	3.93	1.14
Whale Extinction							
Functional Substitution	3.73	4.53	3.89	2.78	3.78	4.00	1.77
Reversal of Trends	7.92	7.92	8.64	8.81	6.53	7.23	6.35**
Hedging	6.63	7.81	7.60	4.97	6.19	7.60	1.77
Wedging	5.02	4.64	4.93	6.62	4.11	3.67	3.85**

*$p < .05$

**$p < .01$

[1]Range for hedging variables = 0-20, for all other variables =0-10.

[2]Individual n's for the publics do not total 225 because of missing data.

[3]Fertilizer was one of the issues included in the general situations scale.

opinion on issues that are remote from his life. That conclusion would seem to explain why opinion polls generally show a wide-spread, but superficial, concern for the environment. However, when the issue is

TABLE 9

Discriminant Analysis of Environmental Publics in Urban Sample

	Discriminant Function		
	I	II	III
Standardized Coefficients of Discriminating Variables			
Commuting	-.19	.07	.39
Hunting and Fishing	-.06	-.40	-.15
Hiking**	-.38	-.51	.18
Swimming**	-.27	.61	.13
Camping**	-.17	.06	.68
Bicycling*	-.02	.24	-.13
Environmental Organizations**	-.03	-.70	.22
Environmental Publications**	-.23	.27	-.11
Age	-.38	.09	.29
Race[1]*	-.18	.39	-.47
Education**	-.45	.24	-.43
Income**	.24	-.09	-.44
Sex[2]	.03	-.15	-.45
Centroids of Publics			
Direct Consequences	.18	-.08	-.47
General	-.52	-.27	-.06
Superhighway	-.25	.12	.38
Unconcerned	.03	.48	-.09
Air Pollution	.64	-.27	-.21
No Public	.53	.34	.14
Canonical Correlation[3, 4]	.42	.30	.24

*$p < .05$

**$p < .01$

[1]High value indicates white race.

[2]High value indicates male.

[3]Only the first discriminant function was significant when all discriminating variables were included in the analysis and when non-significant discriminating variables were excluded in a step-wise analysis.

[4]Functions successfully placed 38 percent of the respondents into correct category when prior probabilities of falling into each group were equal to the size of each group. With six types, 17 percent would be placed correctly by chance.

close to an unconcerned person, such as fertilizer run-off in rural areas and energy, his simple opinion is to develop a replacement.

Research Question 3. This final research question asked whether en-

TABLE 10

Discriminant Analysis of Environmental Publics in Rural Sample

	Discriminant Function			
	I	II	III	IV
Standardized Coefficients of Discriminating Variables				
Hunting	-.48	-.25	.00	.81
Fishing	.07	-.19	.18	-.95
Camping	.18	.38	-.07	.46
Hiking	.24	-.62	-.02	-.44
Age	.03	.40	.11	-.18
Education	.25	-.37	-.13	.16
Race[1]	-.23	-.05	.84	.28
Income	-.14	-.05	.09	-.10
Farmer	.10	-.06	-.33	-.23
Sex[2]	-.17	.04	-.27	.27
Importance of Pollution	.35	-.32	-.02	.26
Pay Taxes to Clean up Pollution*	.58	.42	.12	.06
Centroids of Publics				
General	.14	-.07	.29	-.13
Whales	.28	-.28	-.03	.19
Air Pollution	.21	.36	-.14	-.01
Energy	-.37	-.18	-.20	-.09
No Public	-.81	.32	.33	.25
Canonical Correlation[3, 4]	.33	.26	.21	.13

*$p < .05$

**$p < .01$

[1]High value indicates white race.

[2]High value indicates male.

[3]None of the discriminant functions were significant when all discriminating variables were included in the analysis. The first function was significant when non-significant discriminating variables were excluded in a step-wise analysis.

[4]Functions successfully placed 52 percent of the respondents into correct category when prior probabilities of falling into each group were equal to the size of each group. With five types, 20 percent would be placed correctly by chance.

vironmental publics could be identified from demographic variables, environmental activities, and broad attitude variables. Tables 9 and 10 show the results of a discriminant analysis that attempted to use those variables to discriminate the publics from one another. Only one significant discriminant function could be found in the urban study, and none could be found in the rural study. When non-significant discriminating variables were excluded in a step-wise analysis, one significant function again was found in the urban study and one significant function in the rural study. The functions in the urban study correctly placed 38 percent of the respondents into their actual group, compared to 17 percent that would have been placed correctly by chance. In the rural study, the functions placed 52 percent correctly, compared to 20 percent by chance.

The fact that the discriminant functions are at the borderline of significance should be viewed as support for the situational theory. The way in which people view environmental situations determines what publics they are in, not their demographic attributes. Yet, the majority of studies of environmental attitudes and communication have used largely demographic variables to explain attitudes and communication. The fact that there are some demographic similarities among individuals in different publics means there is some value in examining the discriminant functions to make it easier for an environmental communicator to locate these publics. One should keep in mind, however, that the relationships discussed are weak ones.

Tables 9 and 10 present the maximum number of discriminant functions that can be derived (one less than the number of groups to be discriminated). In the urban study, the first function discriminated the general environmental and the superhighway publics from the other publics. These publics seem to consist of the more educated university students and faculty included in this study (a cross tabulation of the publics by location of interview supported this conclusion). It was probably because a similar group was not included in the rural study that there were no significant functions there. The descriptors of this general environmental public conform to results of previous research. The general public is young, white, and well educated, but below average in income. It reads environmental publications, and hikes, camps, bicycles, and commutes. It does not hunt and fish, however. The general public also is not especially likely to belong to actual environmental organizations.

The second function discriminated the unconcerned and no-public groups from the others. These publics tend to be relatively well educated, black, and female. They also read environmental publications but definitely do not join environmental organizations. They swim and bicycle but do not hike or hunt and fish. The third function largely discriminated

the superhighway public from the direct consequences and air pollution publics. The superhighway public is older, more likely to be black, less educated, of low income, and female. Consistent with the canonical correlation, it would join environmental organizations but would not read environmental publications. This public does take part in several environmental activities and is most likely to be a commuter. Clearly, this superhighway public is one that worries about the environment only when threatened by a superhighway.

The negative values on the third function also help to identify the "direct consequences" public—the public concerned mostly about the energy and air pollution issues that affect most urban residents directly. That public appears to be white, relatively well educated, upper income, and male. It also is unlikely to participate in environmental activities, except to hunt and fish. This "direct consequences" public, however, does not appear to commute and is relatively young.

For the rural sample, each of the four functions discriminated one public from the others. The "no-public" group appeared on each function, probably because members of this group were not members of any of the publics that each function discriminated from the other publics. The general environmental public (Function III) in rural areas tends to be female, not a farmer, of above average income, white, and of above average age. It fishes but does not participate in other outdoor activites. It also had average scores on the two measues of broad attitudes (importance of pollution and willingness to pay taxes to clean up pollution).

The energy public (Function I) is male, white, poorly educated, of above average income, and of average age. It hunts but does not participate in other environmental activities. It also had low scores on the two measures of environmental attitudes. The air pollution public is older and poorly educated, but otherwise is not discriminated by demographic characteristics. It camps but does not participate in other environmental activities. It also had inconsistent scores on the two attitude measures. Finally, the whale public (Function IV) hunts and camps but does not participate in other environmental activities. It is educated, white, and male, thinks pollution is important but does not score highly on willingness to pay taxes to clean up pollution.

Comparing these urban and rural publics reveals some differences in the two types of areas. Generally, the publics are similar in rural and urban areas. There is a general environmental public in both areas and a public concerned about the environment only when it is directly affected—either the direct consequences or the energy public. The unconcerned public showed up only in the urban area, however. The superhighway public showed up in the urban areas only because the issue was not included in the rural study. The whale public existed in the rural

areas because that issue had been included in the general environmental scale in the urban study.

The general environmental public was quite similar in both areas, but it was more likely to be female in rural areas. The direct consequences and energy publics in both urban and rural areas, respectively, represent those people who react only when affected. In the urban areas this public seems to be white, upper middle class males. In the rural areas, however, it seems to be white, lower middle class males. Thus, the image of these publics that emerges is the male upper income businessman in urban areas and the white "redneck" in the rural areas. The unconcerned and the superhighway publics in the urban areas appear to be black females who engage in sports but not other outdoor activities. They remain unconcerned until threatened by a superhighway—or probably another environmental threat. The rural whale public largely seems to be the male environmentalists who take special interest in this issue.

Conclusions

This monograph has identified weaknesses in the cross-situational attitude paradigm which has dominated the field of environmental communication. A situational theory was constructed to replace the attitudinal theory. It was shown to be consistent with the literature on environmental communications and to be capable of explaining the anomalies in attitude theory. Although the results were sometimes mixed, both multiple regression analysis and conditional probabilities of information seeking and processing supported the situational theory—thus adding to the empirical base of the theory.

The theory then was used to isolate situational publics. These publics also were shown to employ different cognitive strategies for different environmental issues. The publics were similar to those found for different issues in Grunig (1979c) and Grunig (1982), suggesting a theoretical consistency in the nature of publics. In both rural and urban samples, the research identified a public concerned with general environmental issues similar to the environmentalist public found in many other studies. This environmentalist public was shown to have the upper social-economic-status characteristics frequently associated with people concerned about the environment. But the study also showed that different publics emerge from special-interest problems such as superhighways and whale extinction. It also showed that when an issue affects nearly everyone, as do energy and air pollution, people become members of special environmental publics who otherwise would not be concerned with the environment. These general-interest, special-interest, and high-involvement-only types of publics seem to appear consistently in studies of publics. Finally, the study showed that publics characterized by

behavior similarities cannot be identified by demographic indicators and personal activities or attitudes, although these variables did help to describe each public and to tie them to previous environmental research.

To judge the quality of a theory one should ask two questions. First, does the theory solve the problems of most interest in a research domain, especially those that present anomalies? Second, are the empirical results strong enough to support the "truth" of the theory and to justify continued use and improvement of the theory?

Although not all readers will agree with the logic of the conceptualization in this monograph, one can reasonably argue that it does provide an explanation of research that previously seemed aligned for or against the attitude paradigm—thus solving the most important empirical anomaly in the domain of environmental communication. Although the empirical results presented in this monograph were not always strong, they did consistently support the theory. Thus, we can conclude that the theory, at least, offers conceptual and empirical promise.

In addition, this monograph has shown the theory to have practical relevance in solving the problems of concern to professional communicators, especially to environmental communicators, but also to communicators dealing with other controversial issues. The publics identified in these studies were consistent enough between urban and rural populations to make it possible to design a communication program for each of them. Of particular importance is the difference between high- and low-involvement publics. This study showed the general environmental public and the special interest publics to be high-involvement, information-seeking publics for which specialized media would be most appropriate. These publics, from the standpoint of the environmental communicator, represent the parishioners who are already in church on Sunday morning. They do not need to be made aware of the importance of an environmental problem. They need to know what to do about the problem. Thus, they could be expected to read specialized environmental magazines or newsletters from environmental groups, join relevant environmental organizations, attend "earth days" and environmental seminars, and monitor local environmental offenders.

These active publics also are low on constraint recognition, indicating that they believe change is possible if they know how to do it. Thus, these publics need action-oriented information to help them reverse pollution or environmental damage. Similarly, a company accused of being a polluter by this public should realize that the public cannot easily be persuaded to the company's point-of-view. The public will demand that the company "clean up its act" and will go to the government to ask for regulations if it does not.

The special publics arising on issues that affect most people directly did

not consistently say they would seek or even process information. Generally the reason appeared to be a high level of constraint recognition. Yet their knowledge about environmental issues was moderate to moderately high, especially in the urban areas. These results suggest that this audience does randomly process environmental information, especially in the mass media—even though the information processing measure did not always show it. (It is doubtful that one can accurately measure information processing with great accuracy using a hypothetical question, especially if the information processing is random.) The unconcerned publics also could be expected to randomly process some information in the mass media.

These two kinds of publics, therefore, probably make up the audience for most environmental articles in the mass media. Although the publics concerned only about the most involving issues would not subscribe to the National Wildlife Federation's legislative alert newsletter, for example, they would read a story in the newspaper about gasoline shortages or about summer days when there are high air pollution levels. They would probably talk a lot about these problems with other people, express indignation with oil companies or government pollution control agencies, and respond in an opinion poll that these are important problems. But that probably would be as far as their environmental activism will take them. That activism will not spread from these issues that affect their everyday life situation to those that do not. These publics thus would probably not become allies of environmentalists seeking public support, or specific actions, in support of the environmental cause. On the other hand, these publics would also not pose much of a threat to a company charged as being a polluter.

The unconcerned public would also randomly process some information in the mass media but would not do much more. Members of this public would not think much about the issues nor discuss them much with others. If someone should attempt to put a freeway through their neighborhood, however, even the unconcerned public will become an active public. Even then the unconcerned public does not communicate much but immediately demands action and will join organizations to demand that action.

Environmental communicators also can look at these publics from the standpoint of the attitudes they hold. Most environmentalists hope to inculcate reversal of trends attitudes in their publics and hope to get these publics to wedge out other attitudes. The general environmental public does wedge in that way on the general environmental issues. The more specialized publics also wedge on issues that brought them about. In addition, the less involved publics—in particular, the no-public group—wedge on the general environmental issues.

Those results clearly explain the high percentages of respondents in public opinion polls who come out against pollution and in favor of restrictive environmental measures. Nearly everyone is against pollution and for cleaning up the environment, although those publics who feel most involved with environmental problems and are most likely to recognize those problems are more likely to hold reversal of trends attitudes with fervor. The other publics hold the reversal of trends attitudes as they hold attitudes on apple pie and motherhood issues—without thinking much about why they hold them. Publicity about environmental problems could, no doubt, further inculcate the reversal of trends solution, but that attitude seldom leads to a pro-environmental behavior by those publics not already actively concerned about the problem.

When the issue involves nearly everyone and especially when people must give up something to reverse a trend, people begin to hedge the reversal of trends attitude. Even the general environmental public hedged on the energy crisis issue, for example. For that kind of issue the environmental communicator faces quite a different problem. For that situation, the communicator too often attempts to change hedging to wedging in favor of reversal of trends. For example, he often tries to convince people that giving up their automobiles or using them less is the only solution to the energy crisis. If that is his objective, these data indicate that he will probably fail. People design behaviors in their self interest—that is, behaviors that best solve the problems that involve them. Few people who must commute to work, for example, and who do not have public transportation available will be willing to make the changes required. Similarly, few will support restrictive anti-pollution measures that would cost them their jobs—such as closing down a plant that cannot be cleaned up.

Given the understanding of human behavior that the situational theory provides, the environmentalist should consider the finding that most people employ the hedging strategy for these highly involving environmental situations to be a positive result. It shows that people will compromise their self interest—through reversal of trends—as long as efforts are made to ease the consequences of that solution—through concurrent application of functional substitution. Thus, the goal of the environmental communicator on these issues should be to reinforce the application of hedging among these publics.

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